

13 GREENHOUSE GAS EMISSIONS

This section describes the existing setting of the project site related to greenhouse gas emissions (GHG) and climate change, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures related to implementation of the proposed Placer County Government Center Master Plan Update Project PCGC Master Plan Update or proposed project), including the Multifamily Residential project located at 1st Street and B Avenue, and the Health and Human Services building near the center of the site. The analysis in this chapter is taken from the California Emissions Estimator Model (CalEEMod) (Version 2016.3.2) modeling prepared for the project, provided in Appendix G.

One comment was received in response to the Notice of Preparation for this EIR that addresses GHGs. The Placer County Air Pollution Control District (PCAPCD) provided information related to the details of the project description relevant to the GHG analysis, the thresholds of significance the PCAPCD has adopted, recommended methodology for the GHG emissions modeling, and mitigation measure recommendations. The Notice of Preparation and comments received in response to it are provided in Appendix A.

13.1 EXISTING CONDITIONS

Climate Change Overview

Climate change refers to any significant change in measures of Earth's climate, such as temperature, precipitation, and wind patterns, lasting for an extended period of time (decades or longer). The Earth's temperature depends on the balance between energy entering and leaving the planet's system. Many factors, both natural and human-caused, can cause changes in Earth's energy balance, including variations in the sun's energy reaching Earth, changes in the reflectivity of Earth's atmosphere and surface, and changes in the greenhouse effect, which affects the amount of heat retained by Earth's atmosphere (EPA 2017a).

The greenhouse effect is the trapping and build-up of heat in the atmosphere (troposphere) near the Earth's surface. The greenhouse effect traps heat in the troposphere through a threefold process, as follows: Short-wave radiation emitted by the sun is absorbed by the Earth, the Earth emits a portion of this energy in the form of long-wave radiation, and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and toward the Earth. The greenhouse effect is a natural process that contributes to regulating the Earth's temperature and creates a pleasant, livable environment on Earth. Human activities that emit additional GHGs to the atmosphere increase the amount of infrared radiation that gets absorbed before escaping into space, thus enhancing the greenhouse effect and causing the Earth's surface temperature to rise.

The scientific record of the Earth's climate shows that the climate system varies naturally over a wide range of time scales, and that, in general, climate changes prior to the Industrial Revolution in

the 1700s can be explained by natural causes, such as changes in solar energy, volcanic eruptions, and natural changes in GHG concentrations. Recent climate changes, in particular the warming observed over the past century, however, cannot be explained by natural causes alone. Rather, it is extremely likely that human activities have been the dominant cause of that warming since the mid-20th century, and is the most significant driver of observed climate change (EPA 2017a; IPCC 2013). Human influence on the climate system is evident from the increasing GHG concentrations in the atmosphere, positive radiative forcing, observed warming, and improved understanding of the climate system (IPCC 2013). The atmospheric concentrations of GHGs have increased to levels unprecedented in the last 800,000 years, primarily from fossil fuel emissions and secondarily from emissions associated with land use changes (IPCC 2013). Continued emissions of GHGs will cause further warming and changes in all components of the climate system, which is discussed further in Potential Effects of Climate Change.

Greenhouse Gases

A GHG is any gas that absorbs infrared radiation in the atmosphere; in other words, GHGs trap heat in the atmosphere. As defined in California Health and Safety Code Section 38505(g) for purposes of administering many of the state’s primary GHG emissions reduction programs, GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃) (see also California Environmental Quality Act (CEQA) Guidelines Section 15364.5).¹ Some GHGs, such as CO₂, CH₄, and N₂O, occur naturally and are emitted into the atmosphere through natural processes and human activities. Of these gases, CO₂ and CH₄ are emitted in the greatest quantities from human activities. Manufactured GHGs, which have a much greater heat-absorption potential than CO₂, include fluorinated gases, such as HFCs, PFCs, and SF₆, which are associated with certain industrial products and processes. The following paragraphs provide a summary of the most common GHGs and their sources.²

Carbon Dioxide. CO₂ is a naturally occurring gas and a by-product of human activities, and is the principal anthropogenic GHG that affects the Earth’s radiative balance. Natural sources of CO₂ include respiration of bacteria, plants, animals, and fungus; evaporation from oceans; volcanic outgassing; and decomposition of dead organic matter. Human activities that generate CO₂ are the combustion of fuels such as coal, oil, natural gas, and wood, and changes in land use.

¹ Climate-forcing substances include GHGs and other substances such as black carbon and aerosols. This discussion focuses on the seven GHGs identified in California Health and Safety Code Section 38505, so impacts associated with other climate-forcing substances are not evaluated herein.

² The descriptions of GHGs are summarized from the Intergovernmental Panel on Climate Change’s (IPCC) Second Assessment Report (1995), IPCC’s Fourth Assessment Report (2007), California Air Resources Board’s “Glossary of Terms Used in GHG Inventories” (CARB 2017a), and U.S. Environmental Protection Agency’s “Glossary of Climate Change Terms” (EPA 2016).

Methane. CH₄ is produced through both natural and human activities. CH₄ is a flammable gas and is the main component of natural gas. Methane is produced through anaerobic (without oxygen) decomposition of waste in landfills, flooded rice fields, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.

Nitrous Oxide. N₂O is produced through natural and human activities, mainly through agricultural activities and natural biological processes, although fuel burning and other processes also create N₂O. Sources of N₂O include soil cultivation practices (microbial processes in soil and water), especially the use of commercial and organic fertilizers, manure management, industrial processes (such as in nitric acid production, nylon production, and fossil-fuel-fired power plants), vehicle emissions, and using N₂O as a propellant (such as in rockets, racecars, and aerosol sprays).

Fluorinated Gases. Fluorinated gases (also referred to as F-gases) are powerful synthetic GHGs emitted from many industrial processes. Fluorinated gases are commonly used as substitutes for stratospheric ozone-depleting substances (e.g., chlorofluorocarbons (CFCs), hydrochlorofluorocarbon (HCFCs), and halons). The most prevalent fluorinated gases are the following:

- **Hydrofluorocarbons:** HFCs are compounds containing only hydrogen, fluorine, and carbon atoms. HFCs are synthetic chemicals used as alternatives to ozone-depleting substances for many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are used in manufacturing.
- **Perfluorocarbons:** PFCs are a group of human-made chemicals composed of carbon and fluorine only. These chemicals were introduced as alternatives, with HFCs, to the ozone-depleting substances. The two main sources of PFCs are primary aluminum production and semiconductor manufacturing. Since PFCs have stable molecular structures and do not break down through the chemical processes in the lower atmosphere, these chemicals have long lifetimes, ranging between 10,000 and 50,000 years.
- **Sulfur Hexafluoride:** SF₆ is a colorless gas soluble in alcohol and ether and slightly soluble in water. SF₆ is used for insulation in electric power transmission and distribution equipment, semiconductor manufacturing, the magnesium industry, and as a tracer gas for leak detection.
- **Nitrogen Trifluoride:** NF₃ is used in the manufacture of a variety of electronics, including semiconductors and flat-panel displays.

Chlorofluorocarbons. CFCs are synthetic chemicals that have been used as cleaning solvents, refrigerants, and aerosol propellants. CFCs are chemically unreactive in the lower atmosphere (troposphere), and the production of CFCs was prohibited in 1987 due to the chemical destruction of stratospheric ozone.

Hydrochlorofluorocarbons. HCFCs are a large group of compounds whose structure is very close to that of CFCs—containing hydrogen, fluorine, chlorine, and carbon atoms—but including one or more hydrogen atoms. Like HFCs, HCFCs are used in refrigerants and propellants. HCFCs were also used in place of CFCs for some applications; however, their use in general is being phased out.

Black Carbon. Black carbon is a component of fine particulate matter, which has been identified as a leading environmental risk factor for premature death. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation, and darkens the surface of snow and ice, which accelerates heat absorption and melting. Black carbon is short-lived and varies spatially, which makes it difficult to quantify its global warming potential. Diesel particulate matter emissions are a major source of black carbon and are toxic air contaminants that have been regulated and controlled in California for several decades to protect public health. Because of the California Air Resources Board's (CARB) regulations pertaining to diesel engines, diesel fuels, and burning activities, CARB estimates that annual black carbon emissions in California were reduced by 70% between 1990 and 2010, with 95% control expected by 2020 (CARB 2014).

Water Vapor. The primary source of water vapor is evaporation from the ocean, with additional vapor generated by sublimation (change from solid to gas) from ice and snow, evaporation from other water bodies, and transpiration from plant leaves. Water vapor is the most important, abundant, and variable GHG in the atmosphere, and maintains a climate that is necessary for life.

Ozone. Tropospheric ozone, which is created by photochemical reactions involving gases from both natural sources and human activities, acts as a GHG. Stratospheric ozone, which is created by the interaction between solar ultraviolet radiation and molecular oxygen (O₂), plays a decisive role in the stratospheric radiative balance. Depletion of stratospheric ozone due to chemical reactions that may be enhanced by climate change results in an increased ground-level flux of ultraviolet-B radiation.

Aerosols. Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant Material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat, and can cool the atmosphere by reflecting light.

Global Warming Potential

Gases in the atmosphere can contribute to climate change both directly and indirectly. Direct effects occur when the gas itself absorbs radiation. Indirect radiative forcing occurs when chemical transformations of the substance produce other GHGs, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects atmospheric processes that alter the radiative

balance of the Earth (e.g., affect cloud formation or albedo (i.e., the reflection of radiation)) (EPA 2016). The Intergovernmental Panel on Climate Change (IPCC) developed the global warming potential (GWP) concept to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The GWP of a GHG is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kilogram of a trace substance relative to that of 1 kilogram of a reference gas (IPCC 2014). The reference gas used is CO₂; therefore, GWP-weighted emissions are measured in metric tons (MT) of carbon dioxide equivalent (CO₂e).

The current version of the California Emissions Estimator Model (CalEEMod) (Version 2016.3.2) assumes that the GWP for CH₄ is 25 (so emissions of 1 MT of CH₄ are equivalent to emissions of 25 MT of CO₂), and the GWP for N₂O is 298, based on the IPCC Fourth Assessment Report (IPCC 2007). The GWP values identified in CalEEMod were applied to the proposed project.

GHG Inventories

United States Emissions. Per the U.S. Environmental Protection Agency’s (EPA) Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2016 (EPA 2018), total U.S. GHG emissions were approximately 6,511.3 million metric tons (MMT) CO₂e in 2016. The primary GHG emitted by human activities in the United States was CO₂, which represented approximately 81.6% of total GHG emissions (5,310.9 MMT CO₂e). The largest source of CO₂, and of overall GHG emissions, was fossil-fuel combustion, which accounted for approximately 93.5% of CO₂ emissions in 2016 (4,966.0 MMT CO₂e). Relative to 1990, gross United States GHG emissions in 2016 are higher by 2.4%, down from a high of 15.7% above 1990 levels in 2007. GHG emissions decreased from 2015 to 2016 by 1.9% (126.8 MMT CO₂e), and, overall, net emissions in 2016 were 11.1% below 2005 levels (EPA 2018).

State of California Emissions. According to California’s 2000–2016 GHG emissions inventory (2018 edition), California emitted 429.40 MMT CO₂e in 2016, including emissions resulting from out-of-state electrical generation (CARB 2018). The sources of GHG emissions in California include transportation, industrial uses, electric power production from both in-state and out-of-state sources, commercial and residential uses, agriculture, high GWP substances, and recycling and waste. The California GHG emissions source categories (as defined in CARB’s 2008 Climate Change Scoping Plan: A Framework for Change (Scoping Plan) (CARB 2008)) and their relative contributions in 2016 are presented in Table 13-1.

Table 13-1
Greenhouse Gas Emissions Sources in California

Source Category	Annual GHG Emissions (MMT CO ₂ e)	Percent of Total ^a
Transportation	169.38	39%
Industrial uses ^b	89.61	21%
Electricity generation ^c	68.58	16%
Residential and commercial uses	39.36	9%
Agriculture	33.84	8%
High GWP substances	19.78	5%
Recycling and waste	8.81	2%
Totals	429.40	100%

Source: CARB 2018.

Notes: GHG = greenhouse gas; MMT CO₂e = million metric tons of carbon dioxide equivalent; GWP = global warming potential.

Emissions reflect 2016 California GHG inventory.

^a Percentage of total has been rounded and total may not sum due to rounding.

^b The Aliso Canyon natural gas leak event released 1.96 MMT CO₂e of unanticipated emissions in 2015 and 0.53 MMT CO₂e in 2016. These leak emissions will be fully mitigated according to legal settlement and are tracked separately from routine inventory emissions.

^c Includes emissions associated with imported electricity, which account for 26.28 MMT CO₂e.

Placer County Emissions. Total GHG emissions for Placer County in 2015 (the most recent year available) were estimated at approximately 1,181,915 MT CO₂e (SBC 2018). Transportation emissions constituted 43 percent of total GHG emissions while residential, agriculture/livestock/forestry, non-residential, solid waste, and water/wastewater represented 21 percent, 16 percent, 11 percent, 7 percent, and 1 percent, respectively. Total per capita GHG emissions from the County in 2015 were 10.7 MT CO₂e per person, a 23 percent decrease from 2005 levels (SBC 2018).

Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The 2014 Intergovernmental Panel on Climate Change Synthesis Report (IPCC 2014) indicated that warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice, rising sea levels, and ocean acidification (IPCC 2014).

In California, climate change impacts have the potential to affect sea-level rise, agriculture, snowpack and water supply, forestry, wildfire risk, public health, frequency of severe weather events, and electricity demand and supply. The primary effect of global climate change has been a 0.2°C (0.36°F) rise in average global tropospheric temperature per decade, determined from meteorological

measurements worldwide between 1990 and 2005. Scientific modeling predicts that continued emissions of GHGs at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. A warming of approximately 0.2°C per decade is projected, and there are identifiable signs that global warming could take place.

Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. The average temperatures in California have increased, leading to more extreme hot days and fewer cold nights. Shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year. Sea levels have risen, and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (CAT 2010).

An increase in annual average temperature is a reasonably foreseeable effect of climate change. Observed changes over the last several decades across the western United States reveal clear signals of climate change. Statewide average temperatures increased by approximately 1.7°F from 1895 to 2011, with warming the greatest in the Sierra Nevada (CCCC 2012). By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 4.1°F to 8.6°F, depending on emissions levels. Springtime warming—a critical influence on snowmelt—will be particularly pronounced. Summer temperatures will rise more than winter temperatures, and the increases will be greater in inland California compared to the coast. Heat waves will be more frequent, hotter, and longer. There will be fewer extremely cold nights (CCCC 2012). A decline in the Sierra Nevada snowpack, which accounts for approximately half of the surface water storage in California, by 30% to as much as 90% is predicted over the next 100 years (CAT 2006).

Model projections for precipitation over California continue to show the Mediterranean pattern of wet winters and dry summers, with seasonal, year-to-year, and decade-to-decade variability. For the first time, however, several of the improved climate models shift toward drier conditions by the mid- to late 21st century in central, and most notably, Southern California. By the late century, all projections show drying, and half of them suggest that 30-year average precipitation will decline by more than 10% below the historical average (CCCC 2012).

A summary of current and future climate change impacts to resource areas in California, as discussed in the Safeguarding California: Reducing Climate Risk (CNRA 2014), is provided below.

Agriculture. The impacts of climate change on the agricultural sector are far more severe than the typical variability in weather and precipitation patterns that occur year to year. Some of the specific challenges faced by the agricultural sector and farmers include more drastic and unpredictable precipitation and weather patterns; extreme weather events that range from severe flooding to

extreme drought to destructive storm events; significant shifts in water availability and water quality; changes in pollinator lifecycles; temperature fluctuations, including extreme heat stress and decreased chill hours; increased risks from invasive species and weeds, agricultural pests, and plant diseases; and disruptions to the transportation and energy infrastructure supporting agricultural production. These challenges and associated short-term and long-term impacts can have both positive and negative effects on agricultural production. Nonetheless, it is predicted that current crop and livestock production will suffer long-term negative effects resulting in a substantial decrease in the agricultural sector if not managed or mitigated (CNRA 2014).

Biodiversity and Habitat. The state’s extensive biodiversity stems from its varied climate and assorted landscapes, which have resulted in numerous habitats where species have evolved and adapted over time. Specific climate change challenges to biodiversity and habitat include species migration in response to climatic changes, range shifts, and novel combinations of species; pathogens, parasites, and disease; invasive species; extinction risks; changes in the timing of seasonal life-cycle events; food web disruptions; and threshold effects (i.e., a change in the ecosystem that results in a “tipping point” beyond which irreversible damage or loss can be recouped). Habitat restoration, conservation, and resource management across California and through collaborative efforts among public, private, and nonprofit agencies has assisted in the effort to fight climate change impacts on biodiversity and habitat. One of the key measures in these efforts is ensuring species’ ability to relocate as temperature and water availability fluctuate due to climate change (CNRA 2014).

Energy. The energy sector provides California residents with a supply of reliable and affordable energy through a complex, integrated system. Specific climate change challenges for the energy sector include temperature rise, fluctuating precipitation patterns, increasing extreme weather events, and sea-level rise. Increasing temperatures and reduced snowpack negatively impact the availability of a steady flow of snowmelt to feed hydroelectric reservoirs. Higher temperatures also reduce the capacity of thermal power plants, since power plant cooling is less efficient at higher ambient temperatures. Increased temperatures will also increase electricity demand associated with air conditioning. Natural gas infrastructure in coastal California is threatened by sea-level rise and extreme storm events (CNRA 2014).

Forestry. Forests occupy approximately 33% of California’s 100 million acres and provide key benefits such as wildlife habitat, absorption of CO₂, renewable energy, and building materials. The most significant climate-change-related risk to forests is accelerated risk of wildfire and more frequent and severe droughts. Droughts have resulted in more large-scale vegetation mortality, and, combined with increasing temperatures, have led to an overall increase in wildfire risks. Increased wildfire intensity subsequently increases public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts, and vegetation conversions. These factors contribute to decreased forest growth, geographic shifts in tree

distribution, loss of fish and wildlife habitat, and decreased carbon absorption. Climate change may result in increased establishment of non-native species, particularly in rangelands where invasive species are already a problem. Invasive species may be able to exploit temperature or precipitation changes, or quickly occupy areas denuded by fire, insect mortality, or other climate change effects on vegetation (CNRA 2014).

Ocean and Coastal Ecosystems and Resources. Sea-level rise, changing ocean conditions, and other climate-change stressors are likely to exacerbate long-standing challenges related to ocean and coastal ecosystems, in addition to threatening people and infrastructure located along the California coastline and in coastal communities. Sea-level rise, in addition to more frequent and severe coastal storms and erosion, are threatening vital infrastructure such as roads, bridges, power plants, ports, airports, gasoline pipes, and emergency facilities, as well as negatively impacting coastal recreational assets such as beaches and tidal wetlands. Water quality and ocean acidification threaten the abundance of seafood and other plant and wildlife habitats throughout California and globally (CNRA 2014).

Public Health. Climate change can impact public health through various environmental changes and is the largest threat to human health in the 21st century. Changes in precipitation patterns affect public health primarily through potential for altered water supplies and extreme events such as heat, floods, droughts, and wildfires. Increased frequency, intensity, and duration of extreme heat and heat waves are likely to increase the risk of mortality due to heat-related illness, and exacerbate existing chronic health conditions. Other extreme weather events are likely to negatively impact air quality and increase or intensify respiratory illness such as asthma and allergies. Additional health effects that may be impacted by climate change include cardiovascular disease, vector-borne diseases, mental health impacts, and malnutrition. Increased frequency of these ailments is likely to subsequently increase the direct risk of injury and/or mortality (CNRA 2014).

Transportation. Residents of California rely on airports, seaports, public transportation, and an extensive roadway network to gain access to destinations, goods, and services. Although the transportation industry is a source of GHG emissions, it is also vulnerable to climate change risks. Particularly, sea-level rise and erosion threaten many coastal California roadways, airports, seaports, transit systems, bridge supports, and energy and fueling infrastructure. Increasing temperatures and extended periods of extreme heat threaten the integrity of the roadways and rail lines. High temperatures cause road surfaces to expand, which leads to increased pressure and pavement buckling. High temperatures can also cause rail breakages, which could lead to train derailment. Other forms of extreme weather events, such as extreme storm events, can negatively impact infrastructure, which can impair movement of people and goods, and potentially block evacuation routes and emergency access roads. Increased wildfires, flooding, erosion, landslides, mudslides, and rockslides can all profoundly impact the transportation system and pose a serious risk to public safety (CNRA 2014).

Water. Water resources in California support residences, plants, wildlife, farmland, landscapes, and ecosystems, and bring trillions of dollars in economic activity. Climate change could seriously impact the timing, form, and amount of precipitation; runoff patterns; and the frequency and severity of precipitation events. Higher temperatures reduce the amount of snowpack and lead to earlier snowmelt, which can impact water supply availability, natural ecosystems, and winter recreation. Water supply availability during the intense dry summer months is heavily dependent on the snowpack accumulated during winter. Increased risk of flooding has a variety of public health concerns, including water quality, public safety, property damage, displacement, and post-disaster mental health problems. Prolonged and intensified droughts can also negatively impact groundwater reserves and result in increased overdraft and subsidence. Droughts can also negatively impact agriculture and farmland throughout the state. The higher risk of wildfires can lead to increased erosion, which can negatively impact watersheds and result in poor water quality. Water temperatures are also prone to increase, which can negatively impact wildlife that rely on a specific range of temperatures for suitable habitat (CNRA 2014).

In March 2016, the California Natural Resources Agency (CNRA) released *Safeguarding California: Implementation Action Plans*, a document that shows how California is acting to convert the recommendations contained in the 2014 *Safeguarding California* plan into action (CNRA 2016). Additionally, in May 2017, the CNRA released the draft *Safeguarding California Plan: 2017 Update*, which is a survey of current programmatic responses for climate change, and contains recommendations for further actions (CNRA 2017). The CNRA released its *Safeguarding California Plan: 2018 Update* in January 2018, which provides a roadmap for state agencies to protect communities, infrastructure, services, and the natural environment from climate change impacts. The 2018 *Safeguarding California Plan* includes 69 recommendations across 11 sectors and more than 1,000 ongoing actions and next steps developed by scientific and policy experts across 38 state agencies (CNRA 2018). As with previous state adaptation plans, the 2018 Update addresses acceleration of warming across the state; more intense and frequent heat waves; greater riverine flows; accelerating sea-level rise; more intense and frequent drought; more severe and frequent wildfires; more severe storms and extreme weather events; shrinking snowpack and less overall precipitation; and ocean acidification, hypoxia, and warming.

13.2 REGULATORY FRAMEWORK

Federal Regulations

Massachusetts v. EPA. In *Massachusetts v. EPA* (April 2007), the U.S. Supreme Court directed the EPA administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In December 2009, the

administrator signed a final rule with the following two distinct findings regarding GHGs under Section 202(a) of the federal Clean Air Act:

- The administrator found that elevated concentrations of GHGs—CO₂, CH₄, N₂O, HFCs, PFCs, and SF₆—in the atmosphere threaten the public health and welfare of current and future generations. This is the “endangerment finding.”
- The administrator further found the combined emissions of GHGs—CO₂, CH₄, N₂O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is the “cause or contribute finding.”

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act.

Energy Independence and Security Act of 2007. The Energy Independence and Security Act of 2007 (December 2007), among other key measures, would do the following, which would aid in the reduction of national GHG emissions (EPA 2007):

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel by 2022.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020, and directs the National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy-efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Federal Vehicle Standards. In response to the U.S. Supreme Court ruling discussed above, the Bush Administration issued Executive Order (EO) 13432 in 2007 directing the EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011, and in 2010, the EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016.

In 2010, President Barack Obama issued a memorandum directing the Department of Transportation, Department of Energy, EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In

response to this directive, EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards projected to achieve 163 grams per mile of CO₂ by model year 2025 on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021. On January 12, 2017, the EPA finalized its decision to maintain the current GHG emissions standards for model years 2022–2025 cars and light trucks (EPA 2017b).

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018. The standards for CO₂ emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6%–23% over the 2010 baselines.

In August 2016, the EPA and NHTSA announced the adoption of phase two of the program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model years 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The final standards are expected to lower CO₂ emissions by approximately 1.1 billion MT and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program (EPA and NHTSA 2016).

State Regulations

The statewide GHG emissions regulatory framework is summarized below by category: state climate change targets, building energy, renewable energy and energy procurement, mobile sources, solid waste, water, and other state regulations and goals. The following text describes executive orders, legislation, regulations, and other plans and policies that would directly or indirectly reduce GHG emissions and/or address climate change issues.

State Climate Change Targets

EO S-3-05. EO S-3-05 (June 2005) established the following statewide goals: GHG emissions should be reduced to 2000 levels by 2010, GHG emissions should be reduced to 1990 levels by 2020, and GHG emissions should be reduced to 80% below 1990 levels by 2050.

AB 32 and CARB's Climate Change Scoping Plan. In furtherance of the goals established in EO S-3-05, the Legislature enacted Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020.

Under AB 32, CARB is responsible for and is recognized as having the expertise to carry out and develop the programs and requirements necessary to achieve the GHG emissions reduction mandate of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions from specified sources. This program is used to monitor and enforce compliance with established standards. CARB also is required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emissions reductions. AB 32 relatedly authorized CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emissions limitation, emissions reduction measure, or market-based compliance mechanism adopted.

In 2007, CARB approved a limit on the statewide GHG emissions level for 2020, consistent with the determined 1990 baseline (427 MMT CO₂e). CARB's adoption of this limit is in accordance with Health and Safety Code Section 38550.

Further, in 2008, CARB adopted the Climate Change Scoping Plan: A Framework for Change (Scoping Plan) in accordance with Health and Safety Code Section 38561. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions for various emission sources/sectors to 1990 levels by 2020. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team (CAT) early actions and additional GHG reduction features by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program. The key elements of the Scoping Plan are the following (CARB 2008):

- Expanding and strengthening existing energy efficiency programs and building and appliance standards.
- Achieving a statewide renewable energy mix of 33%.
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85% of California's GHG emissions.
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets.
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard.
- Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

In the Scoping Plan, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of approximately 28.5% from the otherwise projected 2020 emissions level (i.e., those emissions that would occur in 2020 absent GHG-reducing laws and regulations, referred to as “business-as-usual”). For purposes of calculating this percent reduction, CARB assumed that all new electricity generation would be supplied by natural gas plants, that no further regulatory action would impact vehicle fuel efficiency, and that building energy efficiency codes would be held at 2005 standards.

In the 2011 Final Supplement to the Scoping Plan’s Functional Equivalent Document, CARB revised its estimates of the projected 2020 emissions level in light of the economic recession and the availability of updated information about GHG reduction regulations. Based on the new economic data, CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of 21.7% (down from 28.5%) from the business-as-usual conditions (CARB 2011a). When the 2020 emissions level projection also was updated to account for newly implemented regulatory measures, including Pavley I (model years 2009–2016) and the Renewables Portfolio Standard (RPS) (12% to 20%) (CPUC 2015), CARB determined that achieving the 1990 emissions level in 2020 would require a reduction in GHG emissions of 16% (down from 28.5%) from the business-as-usual conditions.

In 2014, CARB adopted the First Update to the Climate Change Scoping Plan: Building on the Framework (First Update). The stated purpose of the First Update is to “highlight California’s success to date in reducing its GHG emissions and lay the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80% below 1990 levels by 2050” (CARB 2014). The First Update found that California is on track to meet the 2020 emissions reduction mandate established by AB 32, and noted that California could reduce emissions further by 2030 to levels squarely in line with those needed to stay on track to reduce emissions to 80% below 1990 levels by 2050 if the state realizes the expected benefits of existing policy goals.

In conjunction with the First Update, CARB identified “six key focus areas comprising major components of the state’s economy to evaluate and describe the larger transformative actions that will be needed to meet the state’s more expansive emission reduction needs by 2050” (CARB 2014). Those six areas are energy, transportation (vehicles/equipment, sustainable communities, housing, fuels, and infrastructure), agriculture, water, waste management, natural and working lands. The First Update identifies key recommended actions for each sector that will facilitate achievement of EO S-3-05’s 2050 reduction goal.

CARB’s research efforts presented in the First Update indicate that it has a “strong sense of the mix of technologies needed to reduce emissions through 2050” (CARB 2014). Those technologies include energy demand reduction through efficiency and activity changes; large-scale electrification of on-

road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and the rapid market penetration of efficient and clean energy technologies.

As part of the First Update, CARB recalculated the state's 1990 emissions level using more recent GWPs identified by the IPCC. Using the recalculated 1990 emissions level (431 MMT CO₂e) and the revised 2020 emissions level projection identified in the 2011 Final Supplement (CARB 2011a), CARB determined that achieving the 1990 emissions level by 2020 would require a reduction in GHG emissions of approximately 15% (instead of 28.5% or 16%) from the business-as-usual conditions (CARB 2014).

On January 20, 2017, CARB released its 2017 Climate Change Scoping Plan Update (Second Update) for public review and comment (CARB 2017b). This update presents CARB's strategy for achieving the state's 2030 GHG target as established in Senate Bill (SB) 32 (discussed below), including continuing the Cap-and-Trade Program through 2030, and includes a new approach to reduce GHGs from refineries by 20%. The Second Update incorporates approaches to cutting short-lived climate pollutants (SLCPs) under the Short-Lived Climate Pollutant Reduction Strategy (a planning document that was adopted by CARB in March 2017), acknowledges the need for reducing emissions in agriculture, and highlights the work underway to ensure that California's natural and working lands increasingly sequester carbon. During development of the Second Update, CARB held a number of public workshops in the natural and working lands, agriculture, energy, and transportation sectors to inform development of the 2030 Scoping Plan Update (CARB 2016). When discussing project-level GHG emissions reduction actions and thresholds, the Second Update states, "achieving no net increase in GHG emissions is the correct overall objective, but it may not be appropriate or feasible for every development project. An inability to mitigate a project's GHG emissions to zero does not necessarily imply a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA" (CARB 2017b). The Second Update was approved by CARB's Governing Board on December 14, 2017.

EO B-30-15. EO B-30-15 (April 2015) identified an interim GHG reduction target in support of targets previously identified under EO S-3-05 and AB 32. EO B-30-15 set an interim target goal of reducing statewide GHG emissions to 40% below 1990 levels by 2030 to keep California on its trajectory toward meeting or exceeding the long-term goal of reducing statewide GHG emissions to 80% below 1990 levels by 2050, as set forth in EO S-3-05. To facilitate achievement of this goal, EO B-30-15 calls for an update to CARB's Scoping Plan to express the 2030 target in terms of MMT CO₂e. The executive order also calls for state agencies to continue to develop and implement GHG emission reduction programs in support of the reduction targets. EO B-30-15 does not require local agencies to take any action to meet the new interim GHG reduction target.

SB 32 and AB 197. SB 32 and AB 197 (enacted in 2016) are companion bills that set a new statewide GHG reduction targets, make changes to CARB's membership, increase legislative

oversight of CARB’s climate-change-based activities, and expand dissemination of GHG and other air-quality-related emissions data to enhance transparency and accountability. More specifically, SB 32 codified the 2030 emissions reduction goal of EO B-30-15 by requiring CARB to ensure that statewide GHG emissions are reduced to 40% below 1990 levels by 2030. AB 197 established the Joint Legislative Committee on Climate Change Policies, consisting of at least three members of the Senate and three members of the Assembly, to provide ongoing oversight over implementation of the state’s climate policies. AB 197 also added two members of the Legislature to CARB as nonvoting members; requires CARB to make available and update (at least annually via its website) emissions data for GHGs, criteria air pollutants, and toxic air contaminants from reporting facilities; and requires CARB to identify specific information for GHG emissions reduction measures when updating the Scoping Plan.

SB 605 and SB 1383. SB 605 (2014) requires CARB to complete a comprehensive strategy to reduce emissions of SLCPs in the state, and SB 1383 (2016) requires CARB to approve and implement that strategy by January 1, 2018. SB 1383 also establishes specific targets for the reduction of SLCPs (40% below 2013 levels by 2030 for CH₄ and HFCs, and 50% below 2013 levels by 2030 for anthropogenic black carbon), and provides direction for reductions from dairy and livestock operations and landfills. Accordingly, and as mentioned above, CARB adopted its Short-Lived Climate Pollutant Reduction Strategy (SLCP Reduction Strategy) in March 2017. The SLCP Reduction Strategy establishes a framework for the statewide reduction of emissions of black carbon, CH₄, and fluorinated gases.

Building Energy

Title 24, Part 6. Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California’s building standards. Although not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically establishes Building Energy Efficiency Standards that are designed to ensure that new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. These energy efficiency standards are reviewed every few years by the Building Standards Commission and California Energy Commission (CEC) (and revised if necessary) (California Public Resources Code (PRC) Section 25402(b)(1)). The regulations receive input from members of industry and the public, with the goal of “reducing of wasteful, uneconomic, inefficient, or unnecessary consumption of energy” (PRC Section 25402). These regulations are carefully scrutinized and analyzed for technological and economic feasibility (PRC Section 25402(d)) and cost effectiveness (PRC Sections 25402(b)(2) and (b)(3)). These standards are updated to consider and incorporate new energy-efficient technologies and construction methods. As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment.

The 2016 Title 24 standards are the currently applicable building energy efficiency standards, and became effective on January 1, 2017. In general, single-family homes built to the 2016 standards are anticipated to use about 28% less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards, and nonresidential buildings built to the 2016 standards will use an estimated 5% less energy than those built to the 2013 standards (CEC 2015a).

Title 24, Part 11. In addition to CEC’s efforts, in 2008, the California Building Standards Commission adopted the nation’s first green building standards. The California Green Building Standards Code is commonly referred to as CALGreen, and establishes minimum mandatory standards and voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, Material conservation, and interior air quality (CALGreen 2016). The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential, and state-owned buildings, and schools and hospitals. The CALGreen 2016 standards became effective on January 1, 2017. The mandatory standards require the following (CALGreen 2016):

- Mandatory reduction in indoor water use through compliance with specified flow rates for plumbing fixtures and fittings.
- Mandatory reduction in outdoor water use through compliance with a local water efficient landscaping ordinance or the California Department of Water Resources’ Model Water Efficient Landscape Ordinance.
- 65% of construction and demolition waste must be diverted from landfills.
- Mandatory inspections of energy systems to ensure optimal working efficiency.
- Inclusion of electric vehicle charging stations or designated spaces capable of supporting future charging stations.
- Low-pollutant-emitting exterior and interior finish Materials, such as paints, carpets, vinyl flooring, and particle boards.

The CALGreen standards also include voluntary efficiency measures that are provided at two separate tiers and implemented at the discretion of local agencies and applicants. CALGreen’s Tier 1 standards call for a 15% improvement in energy requirements, stricter water conservation, 65% diversion of construction and demolition waste, 10% recycled content in building Materials, 20% permeable paving, 20% cement reduction, and cool/solar-reflective roofs. CALGreen’s more rigorous Tier 2 standards call for a 30% improvement in energy requirements, stricter water conservation, 75% diversion of construction and demolition waste, 15% recycled content in building Materials, 30% permeable paving, 25% cement reduction, and cool/solar-reflective roofs.

The California Public Utilities Commission (CPUC), CEC, and CARB also have a shared, established goal of achieving zero net energy for new construction in California. The key policy timelines are that all new residential construction in California will be zero net energy by 2020, and all new commercial construction in California will be zero net energy by 2030 (CPUC 2013).³ As most recently defined by CEC in its 2015 Integrated Energy Policy Report, a zero net energy code building is “one where the value of the energy produced by onsite renewable energy resources is equal to the value of the energy consumed annually by the building” using the CEC’s time-dependent valuation metric (CEC 2015b).

Title 20. Title 20 of the California Code of Regulations requires manufacturers of appliances to meet state and federal standards for energy and water efficiency. Performance of appliances must be certified through the CEC to demonstrate compliance with standards. New appliances regulated under Title 20 include refrigerators, refrigerator-freezers, and freezers; room air conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwaters; clothes washers and dryers; cooking products; electric motors; low-voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing each type of appliance covered under the regulations, and appliances must meet the standards for energy performance, energy design, water performance, and water design. Title 20 contains three types of standards for appliances: federal and state standards for federally regulated appliances, state standards for federally regulated appliances, and state standards for non-federally regulated appliances.

SB 1. SB 1 (2006) established a \$3 billion rebate program to support the goal of the state to install rooftop solar energy systems with a generation capacity of 3,000 megawatts through 2016. SB 1 added sections to the Public Resources Code, including Chapter 8.8, California Solar Initiative, that require building projects applying for ratepayer-funded incentives for photovoltaic systems to meet minimum energy efficiency levels and performance requirements. Section 25780 established that it is a goal of the state to establish a self-sufficient solar industry in which solar energy systems are a viable mainstream option for homes and businesses within 10 years of adoption, and to place solar energy systems on 50% of new homes within 13 years of adoption. SB 1, also termed “GoSolarCalifornia,” was previously titled “Million Solar Roofs.”

AB 1470. This bill established the Solar Water Heating and Efficiency Act of 2007. The bill made findings and declarations of the Legislature relating to the promotion of solar water heating systems and other technologies to reduce natural gas demand. The bill defined several terms for purposes of the act. The bill required the CEC to evaluate the data available from a specified pilot

³ It is expected that achievement of the zero net energy goal will occur via revisions to the Title 24 standards.

program, and, if it made a specified determination, to design and implement a program of incentives for the installation of 200,000 solar water heating systems in homes and businesses throughout the state by 2017.

AB 1109. Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general purpose lighting to reduce electricity consumption by 50% for indoor residential lighting and by 25% for indoor commercial lighting.

Renewable Energy and Energy Procurement

SB 1078. SB 1078 (2002) established the RPS program, which requires an annual increase in renewable generation by the utilities equivalent to at least 1% of sales, with an aggregate goal of 20% by 2017. This goal was subsequently accelerated, requiring utilities to obtain 20% of their power from renewable sources by 2010.

SB 1368. SB 1368 (2006) requires the CEC to develop and adopt regulations for GHG emissions performance standards for the long-term procurement of electricity by local publicly owned utilities. These standards must be consistent with the standards adopted by the CPUC. This effort will help protect energy customers from financial risks associated with investments in carbon-intensive generation by allowing new capital investments in power plants whose GHG emissions are as low as or lower than new combined-cycle natural gas plants by requiring imported electricity to meet GHG performance standards in California and by requiring that the standards be developed and adopted in a public process.

SB X1 2. SB X1 2 (2011) expanded the RPS by establishing that 20% of the total electricity sold to retail customers in California per year by December 31, 2013, and 33% by December 31, 2020, and in subsequent years be secured from qualifying renewable energy sources. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current, and that meets other specified requirements with respect to its location. In addition to the retail sellers previously covered by the RPS, SB X1 2 added local, publicly owned electric utilities to the RPS.

SB 350. SB 350 (2015) further expanded the RPS by establishing that 50% of the total electricity sold to retail customers in California per year by December 31, 2030, be secured from qualifying renewable energy sources. In addition, SB 350 includes the goal to double the energy efficiency savings in electricity and natural gas final end uses (such as heating, cooling, lighting, or class of energy uses on which an energy-efficiency program is focused) of retail customers through energy conservation and efficiency. The bill also requires the CPUC, in consultation with the CEC, to establish efficiency targets for electrical and gas corporations consistent with this goal.

SB 100. SB 100 (2018) increased the standards set forth in SB 350 establishing that 44% of the total electricity sold to retail customers in California per year by December 31, 2024, 52% by December 31, 2027, and 60% by December 31, 2030 be secured from qualifying renewable energy sources. SB 100 states that it is the policy of the State that eligible renewable energy resources and zero-carbon resources supply 100% of the retail sales of electricity to California. This bill requires that the achievement of 100% zero-carbon electricity resources do not increase the carbon emissions elsewhere in the western grid and that the achievement not be achieved through resource shuffling.

Mobile Sources

AB 1493. In a response to the transportation sector accounting for more than half of California's CO₂ emissions, AB 1493 was enacted in July 2002. AB 1493 required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles that are primarily used for noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. In 2009–2012, standards resulted in a reduction of approximately 22% in GHG emissions compared to emissions from the 2002 fleet, and in 2013–2016, standards resulted in a reduction of approximately 30%.

EO S-1-07. Issued on January 18, 2007, EO S-1-07 sets a declining low-carbon fuel standard for GHG emissions measured in CO_{2e} grams per unit of fuel energy sold in California. The target of the low-carbon fuel standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020. Carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered. CARB adopted the implementing regulation in April 2009. The regulation is expected to increase the production of biofuels, including those from alternative sources, such as algae, wood, and agricultural waste.

SB 375. SB 375 (2008) addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. SB 375 required CARB to adopt regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035. Regional metropolitan planning organizations (MPO) are then responsible for preparing a Sustainable Communities Strategy (SCS) within their Regional Transportation Plan (RTP). The goal of the SCS is to establish a forecasted development pattern for the region that, after considering transportation measures and policies, will achieve, if feasible, the GHG reduction targets. If an SCS is unable to achieve the GHG reduction target, an MPO must prepare an Alternative Planning Strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies.

Pursuant to Government Code Section 65080(b)(2)(K), an SCS does not regulate the use of land; supersede the land use authority of cities and counties; or require that a city's or county's land use policies and regulations, including those in a general plan, be consistent with it. Nonetheless, SB 375 makes regional and local planning agencies responsible for developing those strategies as part of the federally required metropolitan transportation planning process and the state-mandated housing element process.

In September 2010, CARB adopted the SB 375 targets for the regional MPOs. The targets for the Southern California Association of Governments (SCAG) are an 8% reduction in emissions per capita by 2020 and a 13% reduction by 2035 below 2005 levels. Achieving these goals through adoption of an SCS is the responsibility of the MPOs. SCAG's RTP/SCS was adopted by the SCAG Regional Council in April 2012. The plan quantified a 9% reduction in emissions per capita by 2020 and a 16% reduction by 2035 (SCAG 2012). On June 4, 2012, the CARB executive officer issued an executive order accepting SCAG's quantification of GHG reductions and the determination that implementation of the SCS would achieve the GHG emissions reduction targets established by CARB. On April 4, 2016, the SCAG Regional Council adopted the 2016 RTP/SCS, which builds on the progress made in the 2012 RTP/SCS. The updated RTP/SCS quantified an 8% reduction in emissions per capita by 2020, an 18% reduction by 2035, and a 21% reduction by 2040 below 2005 levels (SCAG 2016).

Advanced Clean Cars Program. In January 2012, CARB approved the Advanced Clean Cars program, an emissions-control program for model years 2015 through 2025. The program combines the control of smog- and soot-causing pollutants and GHG emissions into a single, coordinated package. The package includes elements to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars (CARB 2011b). To improve air quality, CARB implemented new emission standards to reduce smog-forming emissions beginning with 2015 model-year vehicles. It is estimated that by 2025, cars will emit 75% less smog-forming pollution than the average new car sold before 2012. To reduce GHG emissions, CARB, in conjunction with the EPA and NHTSA, adopted new GHG standards for model years 2017 to 2025 vehicles; the new standards are estimated to reduce GHG emissions by 34% by 2025. The Zero Emissions Vehicle (ZEV) program will act as the focused technology of the Advanced Clean Cars program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles in 2018 to 2025 model years. The Clean Fuels Outlet regulation will ensure that fuels such as electricity and hydrogen are available to meet the fueling needs of the new advanced technology vehicles as they come to the market.

EO B-16-12. EO B-16-12 (2012) directs state entities under the governor's direction and control to support and facilitate development and distribution of ZEVs. This executive order also sets a long-term target of reaching 1.5 million ZEVs on California's roadways by 2025. On a statewide basis, EO B-16-12 also establishes a GHG emissions reduction target from the transportation sector equaling 80% less than 1990 levels by 2050. In furtherance of this executive order, the

governor convened an Interagency Working Group on ZEVs that has published multiple reports regarding the progress made on the penetration of ZEVs in the statewide vehicle fleet.

AB 1236. AB 1236 (2015), as enacted in California’s Planning and Zoning Law, requires local land use jurisdictions to approve applications for the installation of electric vehicle charging stations, as defined, through the issuance of specified permits unless there is substantial evidence in the record that the proposed installation would have a specific, adverse impact on public health or safety, and there is no feasible method to satisfactorily mitigate or avoid the specific, adverse impact. The bill provides for appeal of that decision to the planning commission. The bill required local land use jurisdictions with a population of 200,000 or more residents to adopt an ordinance, by September 30, 2016, to create an expedited and streamlined permitting process for electric vehicle charging stations. Prior to this statutory deadline, in August 2016, the County of Los Angeles Board of Supervisors adopted Ordinance No. 10437 (N.S.) adding a section to the Los Angeles County Code related to the expedited processing of electric-vehicle charging-station permits consistent with AB 1236.

SB 350. In 2015, SB 350, the Clean Energy and Pollution Reduction Act, was enacted into law. As one of its elements, SB 350 establishes a statewide policy for widespread electrification of the transportation sector, recognizing that such electrification is required for achievement of the state’s 2030 and 2050 reduction targets (see Public Utilities Code Section 740.12).

Solid Waste

AB 939 and AB 341. In 1989, AB 939, known as the Integrated Waste Management Act (PRC Sections 40000 et seq.), was passed because of the increase in waste stream and decrease in landfill capacity. The statute established the California Integrated Waste Management Board, which oversees a disposal reporting system. AB 939 mandated a reduction of waste being disposed of, and jurisdictions were required to meet diversion goals of all solid waste through source reduction, recycling, and composting activities of 25% by 1995 and 50% by 2000.

AB 341 (2011) amended the California Integrated Waste Management Act of 1989 to include a provision declaring that it is the policy goal of the state that not less than 75% of solid waste generated be source-reduced, recycled, or composted by 2020, and annually thereafter. In addition, AB 341 required the California Department of Resources Recycling and Recovery (CalRecycle) to develop strategies to achieve the state’s policy goal. CalRecycle has conducted multiple workshops and published documents that identify priority strategies that CalRecycle believes will assist the state in reaching the 75% goal by 2020.

Water

EO B-29-15. In response to the ongoing drought in California, EO B-29-15 (April 2015) set a goal of achieving a statewide reduction in potable urban water usage of 25% relative to water use in 2013. The term of the executive order extended through February 28, 2016, although many of the directives have since become permanent water-efficiency standards and requirements. The executive order includes specific directives that set strict limits on water usage in the state. In response to EO B-29-15, the California Department of Water Resources modified and adopted a revised version of the Model Water Efficient Landscape Ordinance that, among other changes, significantly increased the requirements for landscape water use efficiency and broadened its applicability to include new development projects with smaller landscape areas.

Other State Regulations and Goals

SB 97. SB 97 (Dutton) (August 2007) directed the Governor’s Office of Planning and Research (OPR) to develop guidelines under CEQA for the mitigation of GHG emissions. In 2008, the OPR issued a technical advisory as interim guidance regarding the analysis of GHG emissions in CEQA documents. The advisory indicated that the lead agency should identify and estimate a project’s GHG emissions, including those associated with vehicular traffic, energy consumption, water usage, and construction activities (OPR 2008). The advisory further recommended that the lead agency determine significance of the impacts and impose all mitigation measures necessary to reduce GHG emissions to a level that is less than significant. The CNRAa adopted the CEQA Guidelines amendments in December 2009, which became effective in March 2010.

Under the amended CEQA Guidelines in the California Code of Regulations (CCR), a lead agency has the discretion to determine whether to use a quantitative or qualitative analysis, or apply performance standards to determine the significance of GHG emissions resulting from a particular project (14 CCR 15064.4(a)). The CEQA Guidelines require a lead agency to consider the extent to which a project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)). The CEQA Guidelines also allow a lead agency to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through implementation of project features or offsite measures. The adopted amendments do not establish a GHG emissions threshold, but allow a lead agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts. The CNRA also acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project’s GHG emissions (CNRA 2009a).

With respect to GHG emissions, the CEQA Guidelines state in CCR Section 15064.4(a) that lead agencies should “make a good faith effort, to the extent possible on scientific and factual data, to

describe, calculate or estimate” GHG emissions. The CEQA Guidelines note that an agency may identify emissions by either selecting a “model or methodology” to quantify the emissions, or by relying on “qualitative analysis or other performance based standards” (14 CCR 15064.4(a)). Section 15064.4(b) states that the lead agency should consider the following when assessing the significance of impacts from GHG emissions on the environment: the extent a project may increase or reduce GHG emissions compared to the existing environmental setting; whether project emissions exceed a threshold of significance that the lead agency determines applies to the project; and the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (14 CCR 15064.4(b)).

EO S-13-08. EO S-13-08 (November 2008) is intended to hasten California’s response to the impacts of global climate change, particularly sea-level rise. Therefore, the executive order directs state agencies to take specified actions to assess and plan for such impacts. The final 2009 California Climate Adaptation Strategy report was issued in December 2009 (CNRA 2009a), and an update, *Safeguarding California: Reducing Climate Risk*, followed in July 2014 (CNRA 2014). To assess the state’s vulnerability to climate change, the report summarizes key climate change impacts to the state for the following areas: agriculture, biodiversity and habitat, emergency management, energy, forestry, ocean and coastal ecosystems and resources, public health, transportation, and water. Issuance of the *Safeguarding California: Implementation Action Plans* followed in March 2016 (CNRA 2016). A draft of the *Safeguarding California Plan: 2017 Update* was prepared to communicate current and needed actions that state government should take to build climate change resiliency (CNRA 2017).

2015 State of the State Address. In January 2015, Governor Brown in his inaugural address and annual report to the Legislature established supplementary goals that would further reduce GHG emissions over the next 15 years. These goals include an increase in California’s renewable energy portfolio from 33% to 50%, a reduction in vehicle petroleum use for cars and trucks by up to 50%, measures to double the efficiency of existing buildings, and measures to decrease emissions associated with heating fuels.

2016 State of the State Address. In his January 2016 address, Governor Brown established a statewide goal to bring per-capita GHG emissions down to 2 MT per person, which reflects the goal of the Global Climate Leadership Memorandum of Understanding (Under 2 Memorandum of Understanding) to limit global warming to less than 2°C by 2050. The Under 2 Memorandum of Understanding agreement pursues emission reductions of 80% to 95% below 1990 levels by 2050 and/or reach a per-capita annual emissions goal of less than 2 MT by 2050. A total of 187 jurisdictions representing 38 countries and six continents, including California, have signed or endorsed the Under 2 Memorandum of Understanding (Under 2 Coalition 2017).

Local Regulations

Sacramento Region Blueprint

In 2007, SACOG, the designated Metropolitan Planning Organization for the Sacramento region, adopted the Preferred Blueprint Scenario for 2050 (Blueprint). Although not a binding regulatory document, the Blueprint depicts a way for local agencies within the region to grow through 2050 in a manner consistent with the seven smart growth principles: (1) transportation choices, (2) mixed-use developments, (3) compact development, (4) housing choice and diversity, (5) use of existing assets, (6) quality design, and (7) natural resources conservation. The seven smart growth principles provide guidance for land use planners, which, when implemented, would ultimately result in an overall reduction in vehicle miles traveled (VMT), emissions of criteria pollutants, and GHG emissions.

SACOG Sustainable Communities Strategy

On February 18, 2016, SACOG adopted the latest update to the Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) for 2036 (SACOG 2016). Building on prior plans, including the Blueprint Growth Strategy discussed below and the 2008 MTP, the SCS accommodates future growth through a more compact land use pattern largely within the region's current development footprint, emphasizes operational improvements over new roadway capacity projects, and reflects other factors that have tended to reduce motor vehicle use. The SCS demonstrates that, if implemented, the region will achieve an 8% below 2005 per-capita GHG reduction in passenger vehicle emissions in 2020 and a 16% reduction in 2035. These reductions meet the GHG targets for SACOG. The 2016 update to the MTP/SCS focused on refinement of and addressing implementation challenges to the previous (2012) plan. The SACOG Board of Directors has adopted five guiding policy themes including, land use forecast, transportation funding, investment strategy, investment timing, and plan effects which provide direction for the plan update.

Placer County General Plan

The *Placer County General Plan* Transportation Element, Public facilities Element, and Air Quality section of the Natural Resources Element provides guidance in land use and development policies for implementation by the Placer County Air Pollution Control District (PCAPCD). The following General Plan policies are applicable to the proposed project:

Goal 3.C To maximize the efficient use of transportation facilities so as to: 1) reduce travel demand on the County's roadway system; 2) reduce the amount of investment required in new or expanded facilities; 3) reduce the quantity of

emissions of pollutants from automobiles; and 4) increase the energy-efficiency of the transportation system.

Policy 3.C.1 The County shall promote the use of transportation systems management (TSM) programs that divert automobile commute trips to transit, walking, and bicycling.

Policy 3.C.2 The County shall promote the use, by both the public and private sectors, of TSM programs that increase the average occupancy of vehicles.

Policy 3.C.3 The County shall work with other responsible agencies to develop other measures to reduce vehicular travel demand and meet air quality goals.

Policy 3.C.4 During the development review process, the County shall require that proposed projects meet adopted Trip Reduction Ordinance (TRO) requirements.

Goal 3.D To provide a safe, comprehensive, and integrated system of facilities for non-motorized transportation.

Policy 3.D.1 The County shall promote the development of a comprehensive and safe system of recreational and commuter bicycle routes that provides connections between the County's major employment and housing areas and between its existing and planned bikeways.

Policy 3.D.3 The County shall pursue all available sources of funding for the development and improvement of trails for non-motorized transportation (bikeways, pedestrian, and equestrian).

Policy 3.D.4 The County shall promote non-motorized travel (bikeways, pedestrian, and equestrian) through appropriate facilities, programs, and information.

Policy 3.D.5 The County shall continue to require developers to finance and install pedestrian walkways, equestrian trails, and multi-purpose paths in new development, as appropriate.

Policy 3.D.7 The County shall, where appropriate, require new development to provide sheltered public transit stops, with turnouts.

Policy 3.D.10 Consider the accessibility and accommodation of cycle and pedestrian traffic, where appropriate, on and across major thoroughfares.

Policy 3.D.12 Provide safe and comfortable routes for walking, cycling, and where feasible, public transportation, to encourage use of these modes of transportation, enable convenient and active travel as part of daily activities, reduce pollution, and meet the needs of all users of the roadway system.

Goal 4.C To ensure the availability of an adequate and safe water supply and the maintenance of high quality water in water bodies and aquifers used as sources of domestic supply.

Policy 4.C.6 The County shall promote efficient water use and reduced water demand by:

- a. Requiring water-conserving design and equipment in new construction;
- b. Encouraging water-conserving landscaping and other conservation measures;
- c. Encouraging retrofitting existing development with water-conserving devices; and,
- d. Encouraging water-conserving agricultural irrigation practices.

Policy 4.C.7 The County shall promote the use of reclaimed wastewater to offset the demand for new water supplies.

Goal 4.G To ensure the safe and efficient disposal or recycling of solid waste generated in Placer County.

Policy 4.G.1 The County shall require all new urban/suburban development, excluding rural development, to include provisions for solid waste collection.

Policy 4.G.2 The County shall promote maximum use of solid waste source reduction, recycling, composting, and environmentally-safe transformation of wastes.

Policy 4.G.12 The County shall ensure that solid waste collection service is available to all residential, commercial, and industrial areas within the current boundaries of Franchise Areas.

Goal 6.F To protect and improve air quality in Placer County.

Policy 6.F.5 The County shall encourage project proponents to consult early in the planning process with the County regarding the applicability of

countywide indirect and area wide source programs and transportation control measures (TCM) programs. Project review shall also address energy-efficient building and site designs and proper storage, use, and disposal of hazardous Masterials.

Policy 6.F.6 The County shall require project level environmental review to include identification of potential air quality impacts and designation of design and other appropriate mitigation measures or offset fees to reduce impacts. The County shall dedicate staff to work with project proponents and other agencies in identifying, ensuring the implementation of, and monitoring the success of mitigation measures.

Policy 6.F.8 The County shall submit development proposals to the PCAPCD for review and comment in compliance with CEQA prior to consideration by the appropriate decision-making body.

Goal 6.G To integrate air quality planning with the land use and transportation planning process.

Policy 6.G.1 The County shall require new development to be planned to result in smooth flowing traffic conditions for major roadways. This includes traffic signals and traffic signal coordination, parallel roadways, and intra- and inter-neighborhood connections where significant reductions in overall emissions can be achieved.

Policy 6.G.3 The County shall encourage the use of alternative modes of transportation by incorporating public transit, bicycle, and pedestrian modes in County transportation planning and by requiring new development to provide adequate pedestrian and bikeway facilities.

13.3 PROJECT IMPACTS

Significance Criteria

The significance criteria used to evaluate the project impacts to greenhouse gases/climate change are based on Appendix G of the CEQA Guidelines. Section 15064.7(c) of the CEQA Guidelines specifies that “[w]hen adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies, or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence” (14 CCR §15064.7(c)). Similarly, the revisions to Appendix G,

Environmental Checklist Form, which is often used as a basis for lead agencies' selection of significance thresholds, do not prescribe specific thresholds. Rather, the CEQA Guidelines establish two new CEQA thresholds related to GHGs, and these will therefore be used to discuss the significance of project impacts:

- Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The PCAPCD recommends the following approach to determine if a project's GHG emissions would result in a significant impact:

- Tier 1 would consist of evaluating whether or not a project qualifies for any applicable exemption under CEQA.
- Tier 2 consists of determining whether the project is consistent with a qualified climate action plan. If a project is consistent with a qualifying local climate action plan, it does not have significant GHG emissions.
- Tier 3 consists of comparing the project's GHG emissions to the de minimis level of 1,100 MT CO₂e per year. If a project does not exceed this threshold, it does not have significant GHG emissions.
- Tier 4 is a bright line threshold level to determine significance using an 82% emission capture rate approach and is 10,000 MT CO₂e per year, for both construction and operational phases. If a project exceeds this cap, impacts are found to be significant. If a project does not exceed this threshold, the project is compared with the efficiency thresholds.
- Tier 5 compares the project emissions to efficiency thresholds. These thresholds are 4.5 MT CO₂e per capita for residential projects in an urban area and 5.5 MT CO₂e per capita for residential projects in a rural area. For nonresidential development, the thresholds are 26.5 MT CO₂e per 1,000 sf for projects in urban areas and 27.3 MT CO₂e per 1,000 sf for projects in rural areas. If a project does not exceed the applicable efficiency threshold, it does not have significant GHG emissions.

Impact Analysis

Impact 13-1	Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?		
	<i>PCGC Master Plan Update</i>	<i>Health and Human Services Building</i>	<i>Multifamily Residential Project</i>
Level of Significance:	Less than significant	Less than significant	Less than significant
Mitigation Measures:	None required	None required	None required
Significance after Mitigation:	Less than significant	Less than significant	Less than significant

PCGC Master Plan Update

Construction Impacts

Construction of the proposed project would result in GHG emissions that would primarily be associated with use of off-road construction equipment, on-road hauling and vendor trucks, and worker vehicles. CalEEMod was used to calculate the annual GHG emissions based on the construction scenario described in Chapter 12 of this EIR. Construction of the proposed project is anticipated to occur over three separate phases: Phase 2 (2024–2025), Phase 3 (2029–2031), and Phase 4 (2034–2035). Notably, Phase 1 would include construction of the new Health and Human Services building and the multifamily residential (Multifamily Residential project) (buildings R1, R1.1, R2, and R2.1) which are assessed in detail within this chapter as separate projects. On-site sources of GHG emissions include off-road equipment and off-site sources including haul trucks, vendor trucks, and worker vehicles.

Subsequent to preparation of the air quality modeling, a second multifamily residential project was moved from Phase 2 into Phase 1, as shown in Figure 3-9, Tiering Plan. This project site includes approximately four acres located in the southwestern corner of the PCGC property and is estimated to support approximately 45 dwelling units. However the County has not identified any specific developers for this project and no detailed site planning has begun. Thus it is not expected that construction of this project would occur in the same year that construction of the other Phase 1 projects occurs. This would ensure that the annual total of construction GHG emissions would be no greater than the amounts reported in this impact analysis and the conclusions of this analysis are applicable to the current Tiering Plan.

Table 13-2 presents construction emissions for the proposed project for all years of construction.

Table 13-2
Estimated Annual Construction Greenhouse Gas Emissions – Proposed PCGC Master
Plan Buildout (Phases 2 – 4)

Year	CO ₂	CH ₄	N ₂ O	CO ₂ e
	<i>Metric Tons per Year</i>			
2024	692.77	0.12	0.00	695.82
2025	568.21	0.06	0.00	569.79
2029	658.12	0.12	0.00	661.20
2030	885.60	0.03	0.00	886.26
2031	378.38	0.01	0.00	378.66
2034	603.32	0.02	0.00	603.86
2035	105.27	<0.01	0.00	105.36
Total	3,891.67	0.36	0.00	3,900.95
<i>PCAPCD GHG Threshold</i>				10,000
Threshold exceeded?				No

Source: Appendix G

Notes: CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrous oxide; CO₂e = carbon dioxide equivalent

As shown in Table 13-2, total construction GHG emissions would be approximately 3,901 MT CO₂e as a result of construction-related activities. Construction GHG emissions are a one-time release and are typically considered separate from operational emissions, as global climate change is inherently a cumulative effect that occurs over a long period of time and is quantified on a yearly basis. As previously discussed, the PCAPCD identifies a GHG emission threshold for construction-related emissions of 10,000 MT CO₂e per year. Table 13-2 indicates that the proposed project would not exceed the PCAPCD GHG threshold for any construction year. Therefore, the proposed project's construction-related GHG emissions would represent a **less than significant** impact.

Operational Impacts

Long-term operations of the proposed project would result in GHG emissions through area sources (landscape maintenance equipment); energy use (natural gas and generation of electricity consumed by the project); generation of electricity associated with wastewater treatment and with water supply, treatment, and distribution; and solid waste disposal. Annual GHG emissions from these sources were estimated using CalEEMod.

CalEEMod default mobile source data, including temperature, trip characteristics, variable start information, emission factors, and trip distances, were used for the model inputs. Because the Transportation Impact Study (TIS) did not provide trip generation for the proposed land uses which includes a mix of uses, trip generation rates for the government, commercial, and residential land

uses were adjusted based on the trip generation rates provided in the project-level assessment in the TIS. Project-related traffic was assumed to be comprised of a mixture of vehicles in accordance with the model defaults for government office building land use traffic. It is assumed that the first full year of project operation would be in the year 2036.

CalEEMod was also used to estimate emissions from the proposed project's area sources, which includes operation of gasoline-powered landscape maintenance equipment, which produces minimal GHG emissions.

Estimation of operational energy emissions was based on CalEEMod land use defaults and total area (i.e., square footage) of the proposed project facilities. Annual natural gas and electricity emissions were estimated in CalEEMod using the emissions factors for Pacific Gas and Electric (the site's energy provider) as a conservative estimate, and adjusted to account for 60% of electricity as a result of the RPS by 2030. As previously discussed, SB 100 requires energy providers to derive 60% of their electricity from qualified renewable sources by 2030. The proposed project would also be required to comply with the 2016 Title 24 standards or the most recent standards at the time of building issuance. The new 2019 Title 24 standards will go into effect January 1, 2020, therefore, using the 2016 Title 24 standards as provided in CalEEMod 2016.3.2 as a basis for energy modeling would be conservative.

Water supplied to the proposed project requires the use of electricity. Accordingly, the supply, conveyance, treatment, and distribution of water would indirectly result in GHG emissions through use of electricity. A 20% reduction in water consumption was incorporated into the CalEEMod model to account for compliance with CALGreen standards. Default water and wastewater factors were assumed.

The proposed project would generate solid waste, and, therefore, result in CO₂e emissions associated with landfill off-gassing. CalEEMod default values for solid waste generation were used to estimate GHG emissions associated with solid waste. A diversion rate of 75% was assumed for the proposed project per requirements of AB 341.

The estimated operational GHG emissions from area sources, energy consumption, solid waste, water consumption, and wastewater treatment associated with the proposed project in 2036 are shown in Table 13-3. Details of the emission calculations are provided in Appendix G.

Table 13-3
Estimated Operational Greenhouse Gas Emissions
Proposed PCGC Master Plan Build-out

Emission Source	CO ₂	CH ₄	N ₂ O	CO ₂ e
	Metric Tons per Year			
Project Build-out				
Area	276.91	<0.01	<0.01	278.65
Energy (natural gas and electricity)	1,604.99	0.10	0.03	1,616.75
Mobile	13,122.30	0.33	0.00	13,130.78
Solid waste	115.56	6.83	0.00	286.30
Water supply and wastewater	107.78	2.65	0.06	192.97
Total Project Build-out Emissions	15,227.54	9.91	0.09	15,505.45
Existing Facilities				
Total Existing Facilities Emissions	7,136.33	7.24	0.06	7,335.96
Net Increase (Project Build-out minus Existing Facilities)				8,169.49
PCAPCD GHG Threshold				1,100
Threshold exceeded?				Yes

Source: Appendix G

Notes: CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrogen dioxide; CO₂e = carbon dioxide equivalent.

Project GHG emissions are based on the “mitigated” CalEEMod outputs which includes incorporation of water reduction consistent with CALGreen and a 75% diversion of solid waste per Assembly Bill 341 the latter of which was assumed for the estimated emissions for the existing facilities.

As shown in Table 13-3, the proposed project would result in an increase of 8,169 MT CO₂e per year relative to existing conditions. Approximately 82% of the proposed project’s annual GHG emissions are from mobile sources; consequently, to reduce GHG emissions any further project vehicle trips would need to be reduced by more than half. Measures have already been included in the proposed project that reduce the project’s GHG emissions from energy consumption, waste, and water use when compared to a typical project.

As previously discussed, the PCAPCD proposes several tiers in determining if a project’s contribution to GHG emissions is significant. Under this approach, the proposed project’s operational GHG emissions would exceed the 1,100 MT CO₂e “de minimis” threshold but would be below the bright-line cap of 10,000 MT CO₂e. For a mixed-used type project, the PCAPCD recommends that significance is determined based upon a comparison meeting either the efficiency threshold of 27.3 MT CO₂e per 1,000 square feet for nonresidential uses or 5.5 MT CO₂e per capita for residential uses (PCAPCD 2017). Based on the net operational GHG emissions attributable to the proposed project of 8,169 CO₂e per year and the total square footage of nonresidential land uses to be developed of 454,600 square feet, the proposed project would result in 18.0 MT CO₂e per capita, which is below the efficiency threshold of 27.3 MT CO₂e per capita recommended by the PCAPCD. Therefore, GHG emissions would result in a **less than significant** impact.

Health and Human Services Building

Construction Impacts

Construction of the Health and Human Services building would result in GHG emissions that would primarily be associated with use of off-road construction equipment, on-road hauling and vendor trucks, and worker vehicles. CalEEMod was used to calculate the annual GHG emissions based on the construction scenario described in Chapter 12 of this EIR. Construction of the Health and Human Services building is anticipated to commence in July 2019 and would be completed by October 2020, for a total duration of approximately 16 months. On-site sources of GHG emissions include off-road equipment and off-site sources including haul trucks, vendor trucks, and worker vehicles.

Table 13-4 presents construction emissions for the proposed Health and Human Services building for 2019 and 2020.

Table 13-4
Estimated Annual Construction Greenhouse Gas Emissions
Health and Human Services Building

Year	CO ₂	CH ₄	N ₂ O	CO ₂ e
	<i>Metric Tons per Year</i>			
2019	313.93	0.08	0.00	315.91
2020	802.58	0.09	0.00	804.81
Total	1,116.51	0.17	0.00	1,120.72
<i>PCAPCD GHG Threshold</i>				10,000
Threshold exceeded?				No

Source: Appendix G

Notes: CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrous oxide; CO₂e = carbon dioxide equivalent

As shown in Table 13-4, total construction GHG emissions would be approximately 1,121 MT CO₂e as a result of construction-related activities. As previously discussed, the PCAPCD identifies a GHG emission threshold for construction-related emissions of 10,000 MT CO₂e per year. Table 13-4 indicates that the Health and Human Services building would not exceed the PCAPCD GHG threshold for any construction year. Therefore, the Health and Human Services building construction-related GHG emissions would represent a **less than significant** impact.

Operational Impacts

Long-term operations of the Health and Human Services building would result in GHG emissions through area sources (landscape maintenance equipment); energy use (natural gas and generation of electricity consumed by the project); generation of electricity associated with wastewater

treatment and with water supply, treatment, and distribution; and solid waste disposal. Annual GHG emissions from these sources were estimated using CalEEMod.

CalEEMod default mobile source data, including temperature, trip characteristics, variable start information, emission factors, and trip distances, were used for the model inputs. Default trip generation rates included in CalEEMod for the Health and Human Services building were adjusted to match the overall daily trips (4,299 trips). Project-related traffic was assumed to be comprised of a mixture of vehicles in accordance with the model defaults for government office building land use traffic. It is assumed that the first full year of project operation would be in the year 2021.

CalEEMod was also used to estimate emissions from the Health and Human Services building's area sources, which includes operation of gasoline-powered landscape maintenance equipment, which produces minimal GHG emissions.

Estimation of operational energy emissions was based on CalEEMod land use defaults and total area (i.e., square footage) of the Health and Human Services building. Annual natural gas and electricity emissions were estimated in CalEEMod using the emissions factors for Pacific Gas and Electric (the site's energy provider) and adjusted to account for 33% of electricity as a result of the RPS by 2020. The Health and Human Services building would also be required to comply with the 2016 Title 24 standards. CalEEMod 2016.3.2 uses the 2016 version of Title 24 as a basis for energy modeling.

Water supplied to the Health and Human Services building requires the use of electricity. Accordingly, the supply, conveyance, treatment, and distribution of water would indirectly result in GHG emissions through use of electricity. A 20% reduction in water consumption was incorporated into the CalEEMod model to account for compliance with CALGreen standards.

The Health and Human Services building would generate solid waste, and, therefore, result in CO₂e emissions associated with landfill off-gassing. CalEEMod default values for solid waste generation were used to estimate GHG emissions associated with solid waste. A diversion rate of 75% was assumed for the Health and Human Services building per requirements of AB 341.

The estimated operational GHG emissions from mobile sources, area sources, energy consumption, solid waste, water consumption, and wastewater treatment associated with the Health and Human Services building in 2021 are shown in Table 13-5. Details of the emission calculations are provided in Appendix G.

Table 13-5
Estimated Operational Greenhouse Gas Emissions
Health and Human Services Building

Emission Source	CO ₂	CH ₄	N ₂ O	CO ₂ e
	Metric Tons per Year			
Health and Human Services Building Project				
Area	<0.01	<0.01	0.00	<0.01
Energy (natural gas and electricity)	449.24	0.02	0.01	451.61
Mobile	2,874.52	0.12	0.00	2,877.63
Solid waste	6.40	0.38	0.00	15.87
Water supply and wastewater	43.78	0.70	0.02	66.47
Total Health and Human Services Building Emissions	3,373.94	1.22	0.03	3,411.58
Existing Health and Human Services Building				
Total Existing Health and Human Services Building Emissions	3,000.86	2.05	0.02	3,058.67
Net increase (Health and Human Services Building minus Existing)				352.91
PCAPCD GHG Threshold				1,100
Threshold exceeded?				No

Source: Appendix G

Notes: CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrogen dioxide; CO₂e = carbon dioxide equivalent.

Project GHG emissions are based on the “mitigated” CalEEMod outputs which includes incorporation of water reduction consistent with CALGreen and a 75% diversion of solid waste per Assembly Bill 341; these measures were not included in the estimated emissions for the existing Health and Human Services building.

As shown in Table 13-5, the Health and Human Services building would result in an increase of 353 MT CO₂e per year relative to existing conditions and would be below the PCAPCD GHG threshold of 1,100 MT CO₂e per year. Therefore, the Health and Human Services building’s GHG emissions would result in a **less than significant** impact.

Multifamily Residential Project

Construction Impacts

Construction of the Multifamily Residential project would result in GHG emissions that would primarily be associated with use of off-road construction equipment, on-road hauling and vendor trucks, and worker vehicles. CalEEMod was used to calculate the annual GHG emissions based on the construction scenario described in Chapter 12 of this EIR. It was assumed that site preparation, grading, and paving activities would occur concurrently with the Health and Human Services building, with the generated GHGs assessed for that project above. Vertical construction of the Multifamily Residential project was assumed to occur immediately following completion of

the Health and Human Services building. It is anticipated to commence in October 2020 and would be completed by August 2021, for a total duration of approximately 11 months. On-site sources of GHG emissions include off-road equipment and off-site sources including vendor trucks and worker vehicles.

Table 13-6 presents construction emissions of the Multifamily Residential project for 2020 and 2021.

Table 13-6
Estimated Annual Construction Greenhouse Gas Emissions
Multifamily Residential project

Year	CO ₂	CH ₄	N ₂ O	CO ₂ e
	<i>Metric Tons per Year</i>			
2020	99.12	0.02	0.00	99.59
2021	310.27	0.06	0.00	311.71
Total	409.39	0.06	0.00	411.30

Source: Appendix G

Notes: CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrous oxide; CO₂e = carbon dioxide equivalent

As shown in Table 13-6, total construction GHG emissions would be approximately 411 MT CO₂e as a result of construction-related activities. As previously discussed, the PCAPCD identifies a GHG emission threshold for construction-related emissions of 10,000 MT CO₂e per year. Table 13-6 indicates that the Multifamily Residential project would not exceed the PCAPCD GHG threshold for any construction year. Therefore, the Multifamily Residential project's construction-related GHG emissions would represent a **less than significant** impact.

Operational Impacts

Long-term operations of the Multifamily Residential project would result in GHG emissions through area sources (landscape maintenance equipment); energy use (natural gas and generation of electricity consumed by the project); generation of electricity associated with wastewater treatment and with water supply, treatment, and distribution; and solid waste disposal. Annual GHG emissions from these sources were estimated using CalEEMod.

CalEEMod default mobile source data, including temperature, trip characteristics, variable start information, and emission factors, were used for the model inputs. Default trip generation rates and trip distances included in CalEEMod for the Multifamily Residential project were adjusted to match the overall daily trips (730 trips) and total average daily VMT (2,016 miles) included in the TIS. Project-related traffic was assumed to be comprised of a mixture of vehicles in accordance with the model defaults for a residential land use traffic. It is assumed that the first full year of project operation would be in the year 2022.

CalEEMod was also used to estimate emissions from the Multifamily Residential project area sources, which includes operation of gasoline-powered landscape maintenance equipment, which produces minimal GHG emissions.

Estimation of operational energy emissions was based on CalEEMod land use defaults and total area (i.e., square footage) of the Multifamily Residential project. Annual natural gas and electricity emissions were estimated in CalEEMod using the emissions factors for Pacific Gas and Electric (the site's energy provider) and adjusted to account for 33% of electricity as a result of the RPS by 2020. The Multifamily Residential project would also comply with the 2016 Title 24 standards as incorporated in CalEEMod.

Water supplied to the Multifamily Residential project requires the use of electricity. Accordingly, the supply, conveyance, treatment, and distribution of water would indirectly result in GHG emissions through use of electricity. A 20% reduction in water consumption was incorporated into the CalEEMod model to account for compliance with CALGreen standards. The Multifamily Residential project would generate solid waste, and, therefore, result in CO₂e emissions associated with landfill off-gassing. CalEEMod default values for solid waste generation were used to estimate GHG emissions associated with solid waste. A diversion rate of 75% was assumed for the Multifamily Residential project per requirements of AB 341.

The estimated operational GHG emissions from mobile sources, area sources, energy consumption, solid waste, water consumption, and wastewater treatment associated with the Multifamily Residential project in 2022 are shown in Table 13-7. Details of the emission calculations are provided in Appendix G. As shown in Table 13-7, the Multifamily Residential project would result in of 639 MT CO₂e per year and would be below the PCAPCD GHG threshold of 1,100 MT CO₂e per year. Therefore, the Multifamily Residential project's GHG emissions would result in a **less than significant** impact.

Table 13-7
Estimated Operational Greenhouse Gas Emissions
Multifamily Residential project

Emission Source	CO ₂	CH ₄	N ₂ O	CO ₂ e
	Metric Tons per Year			
Area	72.10	<0.01	<0.01	72.55
Energy (natural gas and electricity)	148.49	0.01	<0.01	149.28
Mobile	394.77	0.02	0.00	395.34
Solid waste	2.33	0.14	0.00	5.78
Water supply and wastewater	10.65	0.17	<0.01	16.14
Total Emissions				639.09
PCAPCD GHG Threshold				1,100
Threshold exceeded?				No

Source: Appendix G

Notes: CO₂ = carbon dioxide; CH₄ = methane; N₂O = nitrogen dioxide; CO₂e = carbon dioxide equivalent.

Project GHG emissions are based on the “mitigated” CalEEMod outputs which includes incorporation of water reduction consistent with CALGreen and a 75% diversion of solid waste per Assembly Bill 341.

Impact 13-2

	Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?		
	PCGC Master Plan Update	Health and Human Services Building	Multifamily Residential Project
Level of Significance:	Less than significant	Less than significant	Less than significant
Mitigation Measures:	None required	None required	None required
Significance after Mitigation:	Less than significant	Less than significant	Less than significant

PCGC Master Plan Update

There are currently no adopted local or regional GHG reduction plans applicable to the proposed project. Placer County is in the process of developing a sustainability plan that will identify key sources of GHG emissions in the County, will provide various strategies, goals, and actions to assist projects in reducing GHG emissions, and will guide residents adapt to the effects of changing climate conditions.

The SACOG MTP/SCS is a regional growth-management strategy that targets per capita GHG reduction from passenger vehicles and light-duty trucks in the Sacramento region. The MTP/SCS incorporates population growth and local land use forecasts and contains regional transportation system improvements including the following: active transportation (non-motorized

transportation—biking and walking); transportation demand management; transportation system management; transit; passenger and high-speed rail; goods movement; aviation and airport ground access; highways; arterials; and operations and maintenance. The MTP/SCS is not directly applicable to the proposed project because the underlying purpose of the MTP/SCS is to provide direction and guidance by making the best transportation and land use choices for future development, though the proposed project would support the goals and policies of the MTP/SCS. As discussed in Chapter 12, the proposed project would not introduce substantial population and employment growth that is not accounted in local plans or the MTP/SCS. Therefore, the proposed project would be consistent with the regional growth forecasts in the MTP/SCS.

The Scoping Plan, approved by CARB on December 12, 2008, provides a framework for actions to reduce California’s GHG emissions and requires CARB and other state agencies to adopt regulations and other initiatives to reduce GHGs. As such, the Scoping Plan is not directly applicable to specific projects. Relatedly, in the Final Statement of Reasons for the Amendments to the CEQA Guidelines, the CNRA observed that “[t]he [Scoping Plan] may not be appropriate for use in determining the significance of individual projects because it is conceptual at this stage and relies on the future development of regulations to implement the strategies identified in the Scoping Plan” (CNRA 2009). Under the Scoping Plan, however, there are several state regulatory measures aimed at the identification and reduction of GHG emissions. CARB and other state agencies have adopted many of the measures identified in the Scoping Plan. Most of these measures focus on area source emissions (e.g., energy usage, high-GWP GHGs in consumer products) and changes to the vehicle fleet (i.e., hybrid, electric, and more fuel-efficient vehicles) and associated fuels (e.g., Low Carbon Fuel Standard), among others. To the extent that these regulations are applicable to the proposed project, the proposed project would comply with all regulations adopted in furtherance of the Scoping Plan to the extent required by law.

Regarding consistency with SB 32 (goal of reducing GHG emissions to 40 percent below 1990 levels by 2030) and EO S-3-05 (goal of reducing GHG emissions to 80 percent below 1990 levels by 2050), there are no established protocols or thresholds of significance for that future-year analysis. However, CARB has expressed optimism with regard to both the 2030 and 2050 goals. It states in the *First Update to the Climate Change Scoping Plan* that “California is on track to meet the near-term 2020 GHG emissions limit and is well positioned to maintain and continue reductions beyond 2020 as required by AB 32” (CARB 2014). With regard to the 2050 target for reducing GHG emissions to 80% below 1990 levels, the *First Update to the Climate Change Scoping Plan* states the following (CARB 2014):

This level of reduction is achievable in California. In fact, if California realizes the expected benefits of existing policy goals (such as 12,000 megawatts of renewable distributed generation by 2020, net zero energy homes after 2020, existing building retrofits under AB 758, and others) it could reduce emissions by 2030 to levels squarely in

line with those needed in the developed world and to stay on track to reduce emissions to 80% below 1990 levels by 2050. Additional measures, including locally driven measures and those necessary to meet federal air quality standards in 2032, could lead to even greater emission reductions (CARB 2014).

In other words, CARB believes that the state is on a trajectory to meet the 2030 and 2050 GHG reduction targets set forth in AB 32, SB 32, and EO S-3-05. This is confirmed in *California's 2017 Climate Change Scoping Plan (2017 Scoping Plan)*, which states, “This Plan draws from the experiences in developing and implementing previous plans to present a path to reaching California’s 2030 GHG reduction target. The *2017 Scoping Plan* is a package of economically viable and technologically feasible actions to not just keep California on track to achieve its 2030 target, but stay on track for a low- to zero-carbon economy by involving every part of the state” (CARB 2017b). The *2017 Scoping Plan* also states that although “the Scoping Plan charts the path to achieving the 2030 GHG emissions reduction target, we also need momentum to propel us to the 2050 statewide GHG target (80 percent below 1990 levels). In developing this Scoping Plan, we considered what policies are needed to meet our mid-term and long-term goals” (CARB 2017b).

PCAPCD recommends the use of GHG efficiency metrics in order to assess if large scale projects could meet the state’s GHG reduction goals. As previously discussed, project-generated operational GHG emissions would not exceed the PCAPCD efficiency threshold of 27.3 MT CO_{2e} per year for rural nonresidential land uses. As such, since the proposed project would result in emissions below the PCAPCD efficiency threshold, it would also be consistent with the regional targets. Overall, the proposed project would not conflict with any other applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions.

Based on the above considerations, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs, and no mitigation is required. This impact would be **less than significant**.

Health and Human Services Building

As provided in Table 13-5, the Health and Human Services building would not interfere with implementation of any of the above-described GHG reduction goals because emissions would be substantially below the PCAPCD GHG threshold of 1,100 MT CO_{2e} per year, which was established based on the goal of AB 32 to reduce statewide GHG emissions to 1990 levels by 2020. Because the Health and Human Services building would not exceed the threshold, this analysis provides support for the conclusion that the Health and Human Services building would not impede the state’s trajectory toward the above-described statewide GHG reduction goals for 2030 and the project would have a **less than significant** impact.

Multifamily Residential Project

As provided in Table 13-7, the Multifamily Residential project would not interfere with implementation of any of the above-described GHG reduction goals because emissions would be substantially below the PCAPCD GHG threshold of 1,100 MT CO₂e per year, which was established based on the goal of AB 32 to reduce statewide GHG emissions to 1990 levels by 2020. Because the Multifamily Residential project would not exceed the threshold, this analysis provides support for the conclusion that the Multifamily Residential project would not impede the state’s trajectory toward the above-described statewide GHG reduction goals for 2030 and the project would have a **less than significant** impact.

Impact 13-3	Would the project make a cumulatively considerable contribution to emissions of greenhouse gases in the cumulative scenario?		
	<i>PCGC Master Plan Update</i>	<i>Health and Human Services Building</i>	<i>Multifamily Residential Project</i>
Level of Significance:	Less than significant	Less than significant	Less than significant
Mitigation Measures:	None required	None required	None required
Significance after Mitigation:	Less than significant	Less than significant	Less than significant

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The issue of global climate change is inherently a cumulative issue as the GHG emissions of individual projects cannot be shown to have any material effect on the global climate. Thus, the proposed project’s impact to climate change is addressed only as a cumulative impact. The cumulative context for climate change comprises anthropogenic (i.e., human-made) GHG emissions sources across the globe, and no project alone would reasonably be expected to contribute to a noticeable incremental change to the global climate. Subsequently, California has established legislation and regulatory measures providing a statewide context for developing an enforceable statewide cap on GHG emissions. Given the environmental consequences resulting from GHGs and global climate change, CEQA requires that lead agencies consider evaluating the cumulative impacts of GHGs, even relatively small (on a global basis) contributions.

To evaluate whether the proposed project would generate GHG emissions that are cumulatively considerable, total project-generated GHG emissions associated with construction/demolition activities were amortized over a 25-year period to determine the average annual GHG emissions level, which was then compared to an annual bright-line significance threshold. As previously discussed in Impacts 13-1 and 13-2, the thresholds applied in the GHG emissions analysis were the recommended PCAPCD efficiency threshold of 27.3 MT CO₂e per capita for nonresidential land uses in rural areas and the 1,100 MT CO₂e “de minimis” threshold. The proposed project was

determined to result in emissions of 18.0 MT CO₂e per 1,000-square-foot which is below the efficiency threshold recommended by the PCAPCD. Development of the Health and Human Services building and the Multifamily Residential project would result in 353 MT CO₂e and 639 MT CO₂e per year respectively, neither of which would exceed the 1,100 MT CO₂e per year threshold. Therefore, the proposed project would have a **less than significant** impact with regards to cumulatively considerable GHG emissions.

13.4 MITIGATION MEASURES

None required.

13.5 REFERENCES CITED

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